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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Application Number: 10/788,962
Filing Date: February 27, 2004
Appellant(s): LASALANDRA ET AL.

Harold Bennett II, Reg. No. 52,404
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed June 17, 2010 appealing from the Office action mailed December 18, 2009.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 1-24 and 28-31 are pending and currently stand rejected. Claims 25-27 and 32-33 have been canceled.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(**5) Summary of Claimed Subject Matter**

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner.

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

5,173,614	Woehrl, et al.	12-1992
2002/0033047	Oguchi et al.	3-2002
2003/0092493	Shimizu et al.	3-2003

Appellants' Admitted Prior Art, Specification, pages 1 to page 5, line 3

(9) Grounds of Rejection

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-5, 10-12 and 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woehrl (US 5,173,614) in view of applicants' admitted prior art ("APA"; specification, pages 1-3).

With respect to claim 1, Woehrl discloses a multidirectional inertial device (fig 2a-2b; col. 4-5 and 7) having a plurality of detection axes (fig 1) comprising:

inertial sensor means (2, 3), transduction means (7-10, 7'-10') coupled to said inertial sensor means and supplying a plurality of acceleration signals

(output of 10, 10'), each of which is correlated to an acceleration parallel to a respective axes;

first comparison means (41-43, 41'-42') connected to said transduction means and supplying a first recognition signal (L3) when only a first and only a second of said acceleration signals is greater than a respective upper threshold (S5); and

second comparison means (51-53, 51’-52’) connected to said transduction means and for supplying said first recognition signal (L3) when any two signals are greater than a respective lower threshold (Sa4).

Woehrl discloses that the recognition signal is generated when either: 1) a first OR gate (52) senses that only a first/second acceleration signal is above a first threshold; or 2) an AND gate (43) senses that both first/second acceleration signals are above a second threshold. Woehrl does not expressly disclose the second threshold (Sa4) is smaller than the first threshold (Sa5). Woehrl discloses that the thresholds can be selected to any value which would properly indicate a vehicle crash (col. 7, lines 24-30). At the time of the invention by applicants, it would have been obvious to one skilled in the art to select the Woehrl threshold values such that Sa4 is lower (smaller) than Sa5, since it has been held that discovering the optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Woehrl does not expressly disclose using absolute values of the acceleration signals. As stated above, Woehrl discloses that low and negative acceleration values

are filtered (9) and/or removed (10). APA discloses that it is known to use a multidirectional inertial device to supply a recognition signal when the components of force according to a sensor direction exceeds a predetermined threshold (page 1, lines 7-11).

Woehrl provides a recognition signal at L3 based on the sensed values of acceleration sensors. Although Woehrl discloses sending the signal to an airbag system, it would be obvious that the Woehrl recognition signal could be applied to any desired electronic device that is based on acceleration sensors. Woehrl and APA are analogous because they are from the same field of endeavor, namely multidirectional inertial devices. At the time of the invention by applicants, it would have been obvious to combine the threshold levels disclosed in Woehrl with the components of force disclosed in APA. The motivation for doing so would be to detect angled impacts in both sensor directions.

Since Woehrl uses the acceleration sensors to trip an airbag, negative acceleration signals are used to verify the angle of collision and prevent airbag deployment (via 81, 81'; see col. 9). Combining Woehrl with another electronic device would remove the need to prevent providing the recognition signal in the event of a rear impact. Therefore, it would be obvious to either 1) forward all signals (positive and negative) to the Woehrl limit switches (41-42, 51-52) or 2) duplicate the limit switches to also compare negative sensor values against negative threshold levels (in which case OR gate 44 would have four inputs).

With respect to claim 2, Woehrl discloses the first comparison means comprises, for each axis a respective first comparator (51, 51'), which receives the respective one of said upper thresholds (Sa5) and receives the respective one of said acceleration signals, and at least one first logic gate (52), connected to each first comparator.

With respect to claim 3, Woehrl discloses the second comparison means comprises, for each axis, a respective second comparator (41, 41'), which receives the respective one of said lower thresholds (Sa4) and receives the respective one of said acceleration signals, and at least one second logic gate (43) connected to each comparator.

With respect to claim 4, Woehrl discloses the Sa5 thresholds and the Sa4 thresholds are equal to each other, as indicated by the fact that they contain the same designation.

With respect to claim 5, it would have been obvious to set the threshold ratio to 1/√2, since it has been held that discovering the optimum value of a result effective variable involves only routine skill in the art. *Id.*

With respect to claims 10-12, Woehrl and APA disclose the apparatus necessary to complete the recite method, as discussed above in the rejection of claims 1 and 4-5, respectively.

With respect to claims 28-30, Woehrl discloses a device and corresponding method comprising an acceleration circuit (2, 3), a comparator (7-20, 41-43, 51-53) and a logic circuit (43, 53, 44), as discussed above. APA discloses that it is known to use absolute values of acceleration sensors to compute movement in both directions.

Woehrl discloses the step of producing the selected logic value if the level of the acceleration with respect to only the first/second axes exceeds the high threshold comprises producing the selected logic value at an output terminal (output of 44); and the step of producing the selected logic value if the level of acceleration with respect to any two axes exceeds the low threshold comprises producing the selected logic value at the output terminal (col.7 , lines 18-49).

With respect to claim 31, it would be obvious to label the output of logic gate (44) is the output of the inertial device. *Id.* Woehrl disclose that the L3 signal is capable, by itself, of triggering the airbag. But because of the possibility of rear impacts or minor bumps, it would be beneficial to add logic gates to prevent L3 from triggering the air bag unless only a front impact is sensed (col. 9). Therefore, Woehrl provides the motivation for labeling the output of OR gate 44 as the output of the device.

Further, as discussed above, just because the output of 44 is the output of “the device” does not disqualify the remaining logic gates from being part of “another device”, where to two devices operate side by side.

3. Claims 6-8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woehrl in view of APA and Oguchi (US 2002/0033047).

With respect to claims 6-7 and 16, Woehrl discloses an inertial sensor means for each of said preferential detection axes, does not expressly disclose said inertial sensor means comprise at least one micro-electro-mechanical sensor with capacitive unbalancing. APA discloses that it is known to use MEMS in inertial sensors. And

Oguchi discloses an acceleration sensor comprising a micro-electromechanical sensor with capacitive unbalancing (fig 2; par 41-42).

Woehrl, APA and Oguchi are analogous because they are from the same field of endeavor, namely acceleration force sensors. At the time of the invention by applicants, it would have been obvious to a person of ordinary skill in the art to combine the multidirectional inertial device disclosed in Woehrl with the micro-electromechanical sensor with capacitive unbalancing disclosed in Oguchi, in order to use a force sensor with a moveable portion that naturally returns to its original position and can continually operate without constant recalibration.

With respect to claim 8, Woehrl discloses the transduction means comprises a current to voltage converter (2), a filter (8); and a rectifier (9-11, 41, 51). The Woehrl sensor outputs a voltage signal to the filter. It would be obvious to one skilled in the art to include a I/V converter (a resistor) in a system that uses a inertial sensor means that outputs a current signal in order to convert the signal acceptable to input into the filter. Further, the subtractor node would be obvious to one skilled in the art since the output of the Woehrl filter is equivalent to subtracting the output of an oppositely biased filter (band-pass vs. band-gap) from the original signal. The Woehrl rectifier accomplishes the tasks recited in the claim and therefore meets the recited limitation.

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Woehrl in view of APA and Shimizu (US 2003/0092493).

Woehrl discloses a portable electronic apparatus (vehicle) comprising a device for activation (airbag), said device including a multidirectional inertial device, as

discussed above in the rejection of claim 1. APA discloses the acceleration signals are correlated to absolute values of acceleration. Claim 9 differs from claim 1 by changing the name of the recognition signal to reactivation signal. Merely changing the name of a signal does not have an effect on what that signal does.

It is noted that claim 9 does not require supplying the reactivation signal to the electronic apparatus.

Woehrl discloses that the device that receives the reactivation signal is an airbag. As discussed in applicants' Brief, an airbag only deploys once and it does not "reactivate." Shimizu discloses a portable electronic apparatus that receives a signal for reactivation from stand-by (par 55-58). Woehrl, APA and Shimizu are analogous because they are from the same field of endeavor, namely acceleration sensors. At the time of the invention by applicants, it would have been obvious to provide the recognition signal disclosed by Woehrl and APA with the portable electronic apparatus disclosed in Shimizu, since the application of where to send the recognition signal is interpreted as the end use of the signal. Woehrl discloses how to create the signal based on different threshold values and Shimizu discloses that it is known to use an acceleration-based signal to reactivate a device from standby.

5. Claims 13-15, 17-18 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woehrl in view of Shimizu.

With respect to claim 13, Woehrl discloses a device comprising an acceleration circuit (2, 3,); a comparator circuit (41, 41’, 51, 51'); and a logic circuit (43-44, 52), as discussed above in the rejection of claim 1. Shimizu discloses supplying the

acceleration-based signal to a portable electronic device configured to go into stand-by after a period of inactivity and to return to an active state when a signal is provide at an output terminal (par 55-58). Woehrl and Shimizu are analogous, as discussed above in the rejection of claim 9. Claim 13 does <u>not</u> recite using absolute values of the acceleration signals, and therefore, the rejection is not based on APA.

With respect to claim 14, Woehrl discloses a sensor in each detection axes (2, 3); and a transduction circuit (7-11, 7'-11') for each axes to produce the dynamic acceleration signal.

With respect to claim 15, Woehrl discloses a summing junction (10) where a reference value ("static") of acceleration is combined with the filtered signal. At the time of the invention by applicant, it would have been obvious to one skilled in the art that subtracting a negative number is identical to adding a reference value, as taught by Woehrl.

With respect to claim 17, Woehrl discloses two transduction circuits. At the time of the invention by applicants, it would have been obvious to combine the transduction circuits into one circuit (by removing one and passing both signals through the other one) that sequentially outputs the acceleration signals, since it has been held that forming in one piece an article which has formerly been in two pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893).

With respect to claim 18, Woehrl discloses two axes (A2, A3).

With respect to claims 21-24, Woehrl discloses the apparatus necessary to complete the recite method, as discussed above in the rejection of claim 13 and that the detection axes are at right angles (orthogonal and perpendicular) to each other (col. 4, lines 66-67).

6. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woehrl, in view of Shimizu and Ishiyama (US 6,738,214).

Ishiyama discloses a device comprising an acceleration circuit configured to produce a dynamic acceleration signal corresponding to a level of acceleration on each of a plurality of detection axes, where the device further comprises a portable computer (col. 3, line 11 to col. 4, line 6). The Ishiyama acceleration sensor detects when the device is falling and shuts off sensitive internal components. Further, it would have been obvious to a person of ordinary skill in the art to provide the recognition signal to a cell phone. The limitations of a portable computer and cell phone are interpreted as being drawn towards the end use of the device.

Woehrl, Shimizu and Ishiyama are analogous because they are from the same field of endeavor, namely acceleration detection circuits. At the time of the invention by applicants it would have been obvious to configure the device disclosed in Woehrl or Shimizu as the portable computer disclosed in Ishiyama or a cell phone, since this limitation is drawn to the end use of the acceleration circuit. One skilled in the art would recognize the advantages of placing the sensors in any electronic device that would experience acceleration.

(10) Response to Argument

Appellants' first argument (Brief, pages 18-19, bridging paragraph) states that of all of the references considered during the prosecution of the application, "only Shimizu makes any reference to methods or systems for providing reactivation signals for activating a device from standby, or to portable electronic devices that include such devices or circuits" (Brief, page 19, lines 3-5; emphasis added). This statement is an inaccurate summary of the pending claims and the cited references for the following reasons:

First, only claim 9 uses the term "reactivation." Regardless of the name, there is still no positive indication in the claim that this signal is used for any purpose. There is no device or apparatus that is reactivated from a stand-by state in claim 9. Therefore, "reactivation signal" is only a name and carries no implied functionality.

Second, of the seven (7) independent claims, only two independent claims (claims 13, 21) recite the function of using the recognition signal to activate a device from a stand-by state. The remaining five independent claims (claims 1, 9, 10, 28 and 29) do not recite any function or use for the recognition signal. The claims end with the creation of the recognition signal or providing the recognition signal at an output terminal. Even in the claims that recite an output terminal, there is no recitation in those claims that the otuput terminal is connected to any part of the device in order to supply the recognition signal for some use or function. There is no indication in claims 1, 9-10 and 28-29 that the recognition signal is actually used for some purpose or benefit.

Third, only claims 9 and 13 recite the limitation of a “portable electronic apparatus.” The rest of the claims only recite “a device," a limitation which is clearly disclosed by the references.

Appellants contend “none of the remaining six references make even a minor reference or allusion to reactivating a portable electronic device from standby” (Brief, page 19, lines 5-7). As noted above, five of appellants’ seven independent claims do not recite the limitation of reactivating a portable electronic device from a stand-by state. The majority of the claims, as will be discussed below, only recite limitations associated with generating a recognition signal based on two different threshold levels. The claims do not recite any use, function or benefit to this recognition signal.

The Examiner admits that the majority of the primary reference (Woehrl) is directed towards a system or circuit for triggering airbag deployment (Brief, page 19, lines 10-12). The reference, however, also teaches using the sensors to trigger a seat-belt retention device (abstract, lines 1-3). And Woehrl discloses the two-threshold system as recited in the claims, a limitation analysis that is not disputed by the appellants (see Brief, pages 20-21, bridging paragraph).

The Examiner agrees with Appellants’ description of the Woehrl reference (Brief, from page 20 to the top of page 25 including the reproduced figures) and the secondary references (Brief, page 25). One important distinction to note is that the Woehrl trigger signal (TS; which triggers the airbag or seatbelt retention device) is a different signal than the Woehrl recognition signal (L3, output from OR gate 44). Claims 1, 9-10 and 28-29 recite creating a recognition signal, a limitation met by the Woehrl L3 signal.

These claims do not recite using the recognition signal to awaken a device from a standby state. This function would correspond to the Woehrl trigger signal TS.

Appellants contend that Woehrl does not teach “a portable electronic apparatus” (Brief, page 26, heading C.1.). The Examiner maintains that the circuitry within the vehicle, and the vehicle itself, meet the broad limitations of “a portable electronic apparatus" (claims 9, 13). Appellants state “[a]s compared to other electronic devices, the airbag controller is much *less* movable" (Brief, page 27, lines 19-21; emphasis original). Appellants admit that the Woehrl device is at least partially "movable." The claims do not define the apparatus or a minimum level of portability. A device can be portable and not "hand-held" (a freight-shipping container, a refrigerator, etc.). And, as discussed above, independent claims 1, 10, 21 and 28-29 only recite “a device” and do not recite any limitations regarding being "portable."

Appellants next argue against the functionality of the Woehrl L3 signal (Brief, page 28, heading C.2.). First, it is noted that the L3 signal is generated in response to an acceleration event that has produced two perpendicular acceleration signals which are compared against two different threshold levels. The L3 (figure 2A-B) signal is HIGH if the acceleration signals are both greater than a lower threshold (output from gate 52) or any one is greater than a higher threshold (output from gate 43). This function <u>is not disputed by the appellants</u> (Brief, pages 20-21, bridging paragraph). The L3 signal, therefore, is a “recognition signal,” as it meets all of the requirements for its creation set forth in the claims. The signal is generated is response to an event, which means that the signal is created when the circuit “recognizes” that the acceleration even

has occurred. There is no indication in claims 1, 9-10 and 28-29 that the recognition signal has any other use or function, except to be created.

Even though the L3 signal meets the recited limitations of a “recognition signal,” the examiner maintains that the L3 signal, by itself, is also sufficient to be a trigger signal for the airbag or seatbelt device (shown as TS in figure 2B). The Woehrl recognition signal (L3) is created when a forward impact event occurs. The Examiner maintains that the L3 signal is the primary trigger signal and the remaining signals (which are input into AND gates 81, 81’) are used to disqualify the trigger signal if the acceleration event was really a minor event that does not warrant an airbag deployment (see Brief, page 28, lines 16-19). Appellants first argue that the reference does not support this interpretation of the L3 signal and then recognize this function (Brief, page 30, lines 15-16). Regardless of appellants’ contradictory position, Woehrl clearly teaches the use of “signal validating circuits” to ensure that a sufficiently strong frontal impact has occurred (col. 1, lines 54-59; col. 2, lines 16-25, 34-43 and line 62 to col. 3, line 30; col. 3, lines 50-62; col. 8, line 60 to col. 9, line23; col. 8, lines 33-47; col. 8, line 67 to col. 10, line 6; col. 10, lines 27-37 and 45-50; and col. 12, lines 24-30). Therefore, the Examiner’s position that the Woehrl recognition signal (L3) is sufficient, by itself, to produce the trigger signal. The remaining circuits and signals are merely used to disqualify the L3 signal, because in a vehicle with an airbag, it would be undesirable to trigger the airbag if the acceleration event was merely driving over a bumpy road.

Appellants next turn the art rejections of claims 1-5 (Brief, pages 29-34; heading D.1.). Appellants argue that Woehrl cannot teach using an absolute value of the

acceleration sensor because of the teachings of the airbag deployment disqualifying circuits. The Examiner agrees that this is true in the airbag deployment embodiment described in Woehrl. The reference, however, also discloses triggering a seatbelt tightening device. It would be obvious that events that would disqualify an airbag deployment may be useful in tightening a seatbelt. For example, while a bumpy road would not trigger airbag deployment (col. 3, lines 1-6), it would be beneficial to tighten a seatbelt in this situation. Therefore, it would be obvious that in non-airbag deployment embodiments, some or all of the Woehrl validating circuits may not be needed.

Appellants admit that inertial sensors are known (specification, page 1, line 7-10) and such a sensor is shown in figure 2 (Figure 2 should be labeled as “prior art”). Appellants' figure 2 shows that in the X-axis, the sensor can sense movement towards the top of the page as well as the bottom (specification, page 4, lines 9-13).

Although appellants do not use the term “absolute value” in the description of known inertial sensors, appellants use the term "magnitude" to describe the strength of the acceleration signal. As is known in the art, signals (such as A in appellants’ figure 1) are characterized by magnitude and direction (specification, page 2, lines 21-23). The magnitude is the absolute value of the strength of the signal, and the direction is the angle of the signal relative to a reference axis. The horizontal and vertical components of the magnitude can be found through trigonometry, as shown in the specification (pages 2-3). Therefore, appellants’ admitted prior art provides the teaching missing from Woehrl; that it is known to use the absolute value of an acceleration signal when determining if the signal exceeds a threshold. And Woehrl

provides the teaching missing from the admitted prior art, that it is known to compare the two acceleration signals with two different threshold levels (specification, page 2, lines 11-16).

Appellants contend that "Woehrl cannot supply recognition signals in response to the absolute value of acceleration while also differentiating between positive and negative acceleration (Brief, page 29, lines 25-26). The Examiner agrees with this statement, but only in the embodiment of airbag deployment. Woehrl discloses the benefits of using validating circuits, such as negative impact circuit (fig 2A, item D) to override or cancel L3 from becoming the trigger signal. However, as discussed above, when using the acceleration circuit in a seatbelt tightening device (or any other acceleration-based function), it may be beneficial to include negative acceleration values. Appellants' admitted prior art discloses that comparing the magnitudes (i.e. absolute values) of acceleration signals against a threshold is known. Therefore, one skilled in the art would look to Appellants' admitted prior art to modify the Woehrl sensor in order to use the sensor for any non-airbag deployment related acceleration sensor applications.

The combination of Woehrl and Appellants' admitted prior art does not render Woehrl unsatisfactory for its intended purpose (Brief, page 30, lines 2-20). In the case of the airbag, it is appropriate to use negative acceleration signals to disqualify an acceleration event that may improperly deploy the airbags. However, if the acceleration sensors were used with a different device (such as a seatbelt tightening device), the benefits of including rear acceleration signals would be obvious. Since the Woehrl

inertial sensor is not limited to airbag deployment, combining Woehrl with Appellants' admitted prior art would not frustrate Woehrl's explicitly stated intent.

Appellants present the Examiner's argument that there is no use or function to the claimed recognition signal (Brief, page 31, starting at line 2). Appellants have not argued against or rebutted this interpretation of the claims. Instead, the appellants contend that the intended use of the Woehrl sensor must be taken into account. As discussed above, Woehrl discloses using the sensor for a seatbelt tightening device. One skilled in the art would recognize the functions provided by the Woehrl circuitry and would be able to change/omit certain circuit paths and logic gates in order to allow the recognition signal L3 to trigger the device under proper acceleration conditions.

For example, using the Woehrl L3 signal as the claimed "recognition signal," in order to modify the reference to meet the limitation of using "absolute values," one skilled in the art would only need to remove the subtraction node (10, 10') and configure the threshold switch circuits (41, 41', 51, 51') to compare both the positive and negative values to a threshold level. The rest of the circuitry (all of the logic gates of Woehrl figure 2A) is immaterial, since the "recognition signal" has already been generated at L3. One skilled in the art could leave them, modify them or delete them. Their use is immaterial, since the recognition signal has already been generated. Since claim 1 does not recite where the recognition signal is sent or what it does, Woehrl only needs to teach how the signal is created/generated.

Appellants ask "what would motivate the person of ordinary skill, *absent the language of claim 1 as a template*, to make such radical modifications to an airbag

trigger circuit" (Brief, page 32, lines 1-5). The Woehrl inertial sensor is not limited to airbag deployment. Therefore, the reference provides the motivation to modify the circuit. And, as shown above, providing absolute values to the threshold switches (41, 41', 51, 51') is not a "radical" modification.

Appellants state "Woehrl has clear and explicit intentions, with respect to the 'additional logic gates,' which do not meet the limitations of claim 1, but instead teach away from the claim limitations" (Brief, page 32, lines 10-11). Woehrl teaches that acceleration signals are input to first/second comparison means (41, 51) to create a recognition signal (L3). <u>The claim stops there</u>. There are no limitations in claim 1 regarding using the recognition signal for any function or sending the signal to any other device. How can Woehrl teach away from the claimed limitations when the claim is <u>silent</u> as to how the recognition signal is used? Furthermore, the plain language of "recognition" means that the signal is generated <u>in response</u> to an event. The signal does <u>not cause</u> a secondary event or function.

The original claims (February 27, 2004) referred to the recognition signal as "a pre-determined logic value." In the amendment filed July 3, 2007 (after the third office action), the limitation was changed to "a selected logic value." Finally, in the amendment filed September 11, 2008, appellants changed the limitation to "a first recognition signal." In the next office action (Final Rejection, October 16, 2008), the Examiner presented the interpretation that the "recognition" signal is generated in response to an event and does not indicate creating, generating or activating a future event (page 2, two first full paragraphs). At no point during the prosecution of the

application have claims 1, 9-10 or 28-29 recited a use or function for the recognition signal. The claims only require that a reference disclose the means, method or apparatus for creating the signal.

In the limitation analysis of Woehrl, it is not necessary to consider the functions of the "additional logic gates." These logic gates have no equivalent in claim 1 because the claim is silent regarding what happens to the recognition signal. Therefore, these gates do not "teach away" from the limitations of the claim. While the Examiner agrees that the additional logic gates do not correspond to the intended invention as described in the specification, appellants' intentions are not claimed limitations. When conducting the limitation analysis of the reference, the Examiner needs only consider the claimed limitations, not every conceived embodiment in the specification.

Claim 1 is directed towards the means for creating the recognition signal, not using the signal. Therefore, the prior art references only need to teach the creation of the recognition signal. As demonstrated above, modifying the Woehrl reference is not "unforeseen or unintended" (Brief, page 32, last paragraph).

Appellants next argue against the motivation to combine Woehrl with Appellants' admitted prior art (Brief, page 33). The Examiner agrees that Woehrl creates a separate circuit designed to detect negative signals. As discussed above, the Woehrl inertial sensor is not limited to airbag deployment. One skilled in the art would be motivated to use the Woehrl two-threshold acceleration circuit in any device that would expect an angled impact, including seatbelt tightening devices. As demonstrated above, one skilled in the art would be motivated to change or remove the validating

circuits from the system and compare the magnitude of acceleration signals (i.e. absolute values) to allow the recognition signal L3 to activate the trigger signal TS to control a seatbelt tightening device.

Claim 31 (Brief, page 34, heading D.2.) recites that the inertial sensor has an output terminal and the first/second comparison means are configured to supply the recognition signal at the output terminal. Appellants first argue the “absolute value” limitation of claim 1 (first paragraph of heading 2), which has been addressed in the discussion of claim 1.

As discussed above, claim 1 does not recite that the recognition signal has any use or function after it is created. Claim 31 recites supplying the recognition signal to “an output terminal.” This output terminal, however, is not connected to anything. It is merely a name for the node on the claimed multidirectional inertial device on which the recognition signal exists. Appellants state, “[u]se of L3 as an output terminal would prevent Woehrl’s circuit from performing correctly" (Brief, page 35, lines 20-21) and “[a] device modified as proposed by the Examiner would not operate according to Woehrl’s established function” (Brief, page 36, lines 14-15).

The Examiner maintains that “output terminal” is only a name. <u>It imparts no functionality to the device of claim 1</u>. The output of OR gate 44 can be an output terminal without destroying the functionality of the trigger signal TS or the terminal from which the trigger signal is provided. The Woehrl recognition signal L3 and the trigger signal TS <u>are two different signals</u>. While the trigger signal TS passes through an

output terminal to the airbag or seatbelt tightening device, recognition signal L3 also passes “an output terminal.”

The limitation of “an output terminal” does not introduce the function of sending the recognition signal to another device into claim 31. Claims 1 and 31 do not recite any use of function for the recognition signal, except to say that it is supplied to the “output” of the device. This broad limitation is met by Woehrl.

Regarding claims 10-12 (Brief, pages 36-37; heading D.3.), the limitation of “absolute value” has been addressed above. Appellants’ admitted prior art discloses that it is known to compare acceleration magnitudes to a threshold and the combination of references is proper (Brief, page 37, lines 16-19).

It is noted that claim 10 recites a method for detecting the state of motion of “a device.” There are no limitations regarding “portability” or any device that is stand-by and is reactivated because it receives the recognition signal.

Regarding claims 28-29 (Brief, page 38, headings D.4. and D.5.), appellants appear to refer to the arguments regarding claim 1. As shown above, claim 1 is properly rejected over the art of record. It is noted that there are no limitations in claim 28 or claim 29 regarding “portability” or any device that is stand-by and is reactivated because it receives the recognition signal.

Regarding claims 6-8 and 16 (Brief, page 38, heading E.), claims 6-8 depend from claim 1 and claim 16 depends from claim 13. Independent claims 1 and 13 remain rejected. Appellants have not specifically argued against the art rejections of these dependent claims.

Regarding claim 13 (Brief, page 38, heading F.1), appellants state “neither reference teaches or suggests a logic circuit configured to produce the first recognition signal at the output if the dynamic acceleration signals of any two of the plurality of detection axes exceed their respective lower threshold" (Brief, page 39, lines 6-9). As discussed above, it would be obvious to label the output of OR gate 44 as "an output terminal." This is because the Woehrl L3 signal is sufficient, by itself, to produce a trigger signal to activate either the airbag or the seatbelt tightening device. The remaining logic gates provide a validating signal that cancel L3 if the acceleration event is not a large head-on crash.

Appellants recite “the Examiner … points to Shimuzu’s paragraph 55-58 as teaching the output terminal” (Brief, page 39, lines 10-20). This statement is an incorrect summary of the Examiner’s position. Shimizu is relied upon as a secondary reference because it discloses a device that goes into a standby state after a period of inactivity and returns to an active state when an acceleration signal is provided (to an output terminal). While an “output terminal” is obvious in view of Shimizu, it is not the sole purpose of the reference. As appellants admit, Shimizu discloses a device that is awakened by activating an acceleration sensor (Brief, page 39, lines 14-15). Therefore, the appellants admit that Shimizu includes two components, a main device and an internal sensor enclosed within the device.

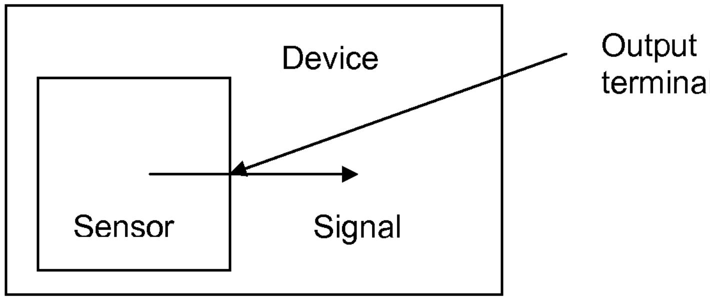

FIGURE A

As shown in figure A, a border exists between the sensor and the device; otherwise they would form one component with one name. The acceleration wake up signal is created within the sensor then crosses into and is received by the device. Since there are two components and a signal that passes from one component to the other, "an output terminal" is <u>obviously</u> present. One skilled in the art would not need a schematic or explicit mention of an output terminal in order to understand the path the Shimizu acceleration signal takes between the two components.

Appellants return to Woehrl and state that the reference “places no special importance on the signal at L3, except as one of many internal signals” (Brief, page 39, lines 22-23). As demonstrated above and admitted by appellants (Brief, page 30, lines 15-16), the L3 signal is the main activation signal. The remaining signals serve to “validate” L3 and have the ability to cancel L3 if the acceleration event does not warrant triggering airbag deployment. One skilled in the art would recognize that if the device were not an airbag (a seatbelt tightening device, for example), these validating circuit may not be needed and L3 could be used to trigger the device directly.

Appellants provide an example of modifying Woehrl (Brief, page 30, lines 5-13), including using logic gates 52 and 66. This example, however, does not include AND gate 43, which is a major component in determining angled impacts. Without gate 43, L3 will not be produced. This example appears to destroy the functionality of the device.

Regarding claim 15 (Brief, pages 40-41; heading F.2.), appellants argue that the claimed static acceleration value refers to a static acceleration signal that is "often" included in signals from inertial sensors. Claim 15 does not recite that the device of claim 15 definitively includes a continuous component that represents the constant acceleration of gravity. Appellants contend that since a gravity constant is often included in inertial sensors, then it must be included in the recitation of claim 15. This argument is not supported by the claim langue. Claim 15, using a static acceleration “value” (not a static acceleration “signal”) and does not include any reference to gravity. This opens the claim to an interpretation that may not seem consistent with appellants’ intention. Woehrl discloses subtracting a reference value from the dynamic acceleration signal. The reference value is number, which makes it a “value.” It is constant, which makes it “static." And the reference value is combined with an acceleration signal, which makes it “a static acceleration value."

Regarding claim 17 (Brief, page 41; heading F.3.), appellants argue the case law cited by the Examiner in rejecting the claim is not proper. Appellants have taken two known acceleration circuits and replaced them with one circuit that computes acceleration signals one at a time (“sequentially”). To support this obvious modification,

the Examiner relied upon *Howard v. Detroit Stove Works*. The holding of this case is often relied upon by examiners during patent prosecution to support the modification of combining multiple components into one integral component. The Examiner is not aware of any case law or Board decision that prohibits applying the *Howard* holding to electronic circuits.

Regarding claims 21-22 (Brief, page 42; heading F.4), appellants argue that the Woehrl airbag cannot return to its previous state. The Examiner agrees with this statement, but maintains that Woehrl is also directed towards a seatbelt tightening device. As is well known in the art, a seatbelt tightening device is active during breaking or severe acceleration events, and returns to its previous state (loose and adjustable) during other times. Therefore, Woehrl meets the limitations of claim 13. Shimizu provides further support by showing that it is known to use inertial sensors to wake a device from standby. Shimizu resolves any deficiencies of Woehrl.

Regarding claim 30 (Brief, page 43; heading F.5), the claim remains rejected for the reasons discussed above with respect to claim 30.

Regarding claim 9 (Brief, page 43; heading G), the claim appears to only differ from claim 1 by changing "recognition signal" to "reactivation signal." While, on its face, this would appear to change the scope of the claim, the reactivation signal still has no use or function. It does not “reactivate” any device or circuit. Therefore, the term "reactivation signal" is interpreted as only a change in name and not a change function. Claim 9 remains rejected for the reasons discussed with respect to claims 1, 13 and 31.

Regarding claim 19 (Brief, page 43; heading H.1.), the limitation of “a cell phone” is interpreted as being drawn towards the end use of the device. An inertial sensor will operate in the same way regardless of the device it is placed inside. The Woehrl inertial sensor will continue to compare perpendicular acceleration signals against two threshold levels to provide a recognition signal. This function is not altered by moving the acceleration sensor from the Woehrl vehicle to the Shimizu gaming system.

One skilled in the art would modify the Woehrl sensor, since as discussed above, the validating signals to cancel L3 are mainly used for controlling airbag deployment. Other devices, such as a seatbelt tightening device, would require a change or removal of the validating circuits. Shimizu discloses using an inertial sensor in a portable gaming system. It would be obvious to one skilled in the art that a gaming system and a cell phone are art recognized equivalents for their function as hand-held electronic circuits that utilize inertial sensors.

Regarding claim 20 (Brief, page 44; heading H.2.), claim 20 remains rejected, since it depends from rejected claim 13. Similarly to claim 19, the claim is directed towards the end use of the device. Regardless of the type of electronic device used, the inertial sensor will function in the same way.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner’s answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Adi Amrany

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Examiner, Art Unit 2836

/Jared J. Fureman/

Supervisory Patent Examiner, Art Unit 2836

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